

BFL 2 antenna Information

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Antenna Detailed Information

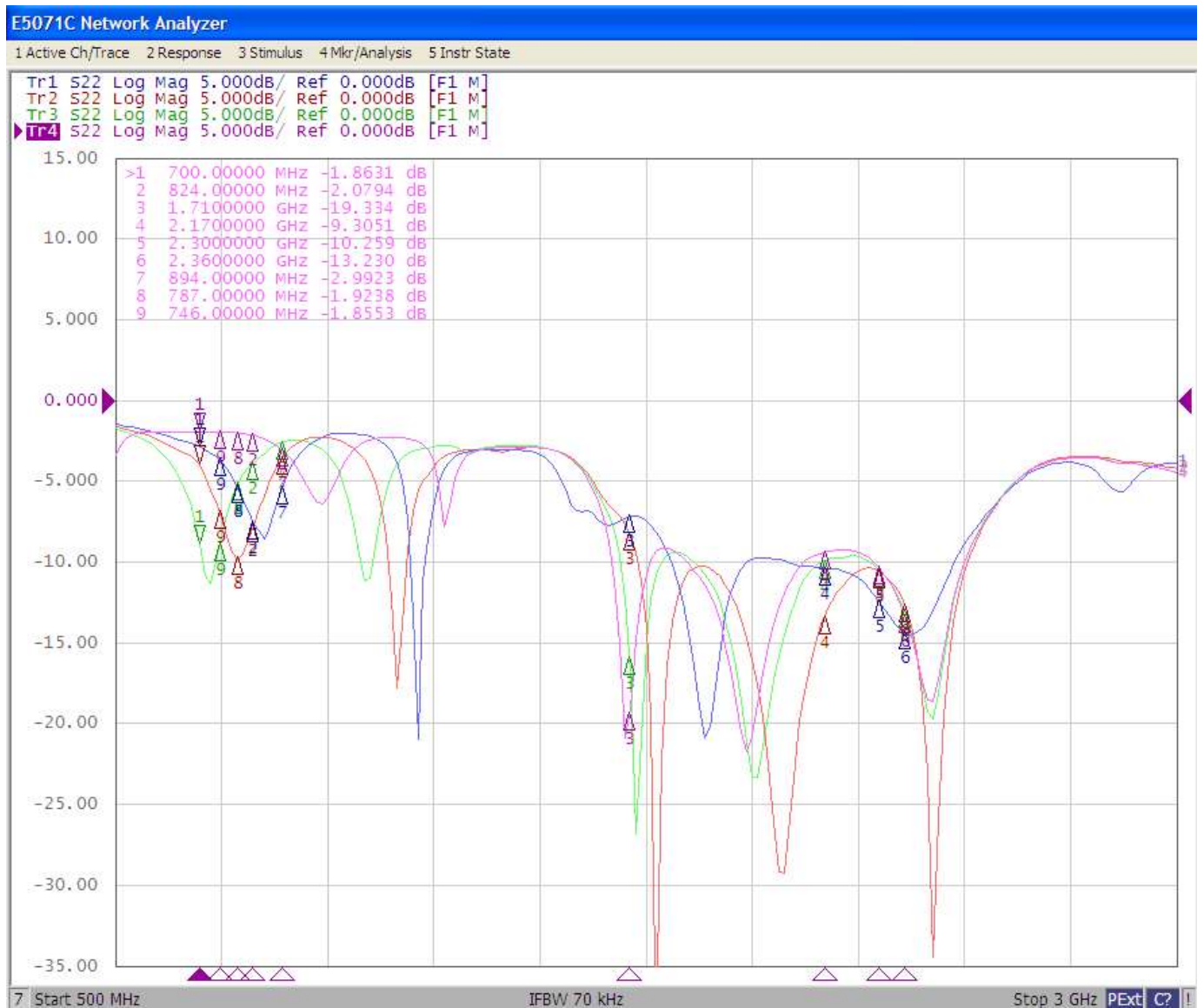


Antenna performance

Electric – Requirement and Measurement	
Parameter	Spec.
VSWR	<3:1
Return Loss	<-6dB
Peak Gain	LTE B2, WCDMA II : 1.2dBi LTE B4, WCDMA IV : 1.9dBi LTE B30: -0.5dBi LTE B5, WCDMA V : -4dBi LTE B12 : -2.1dBi LTE 14 : -1.8dBi GPS: 0.98dBi WIFI 2.4G/BT: 0.8dBi, WIFI 5G: 0.4dBi
Efficiency	LTE B2, WCDMA II : 45.06% LTE B4, WCDMA IV : 43.75% LTE B30: 26.48% LTE B5, WCDMA V : 18.00% LTE B12 : 28.53% LTE 14 : 28.51%
Isolation	<-13dB
Radiation Pattern	Omni-directional

Antenna return loss

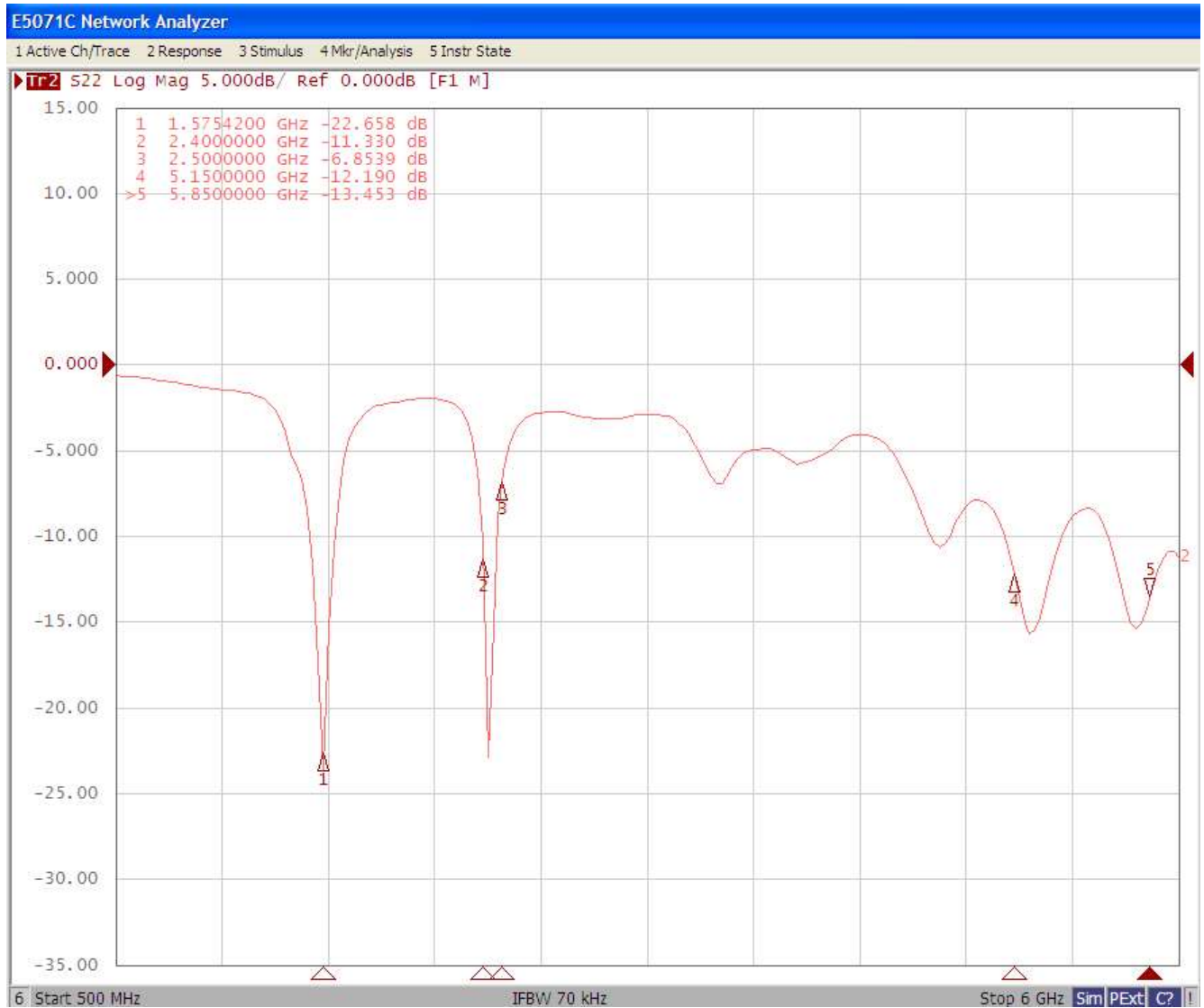
Main Antenna Return Loss



Diversity antenna Return loss

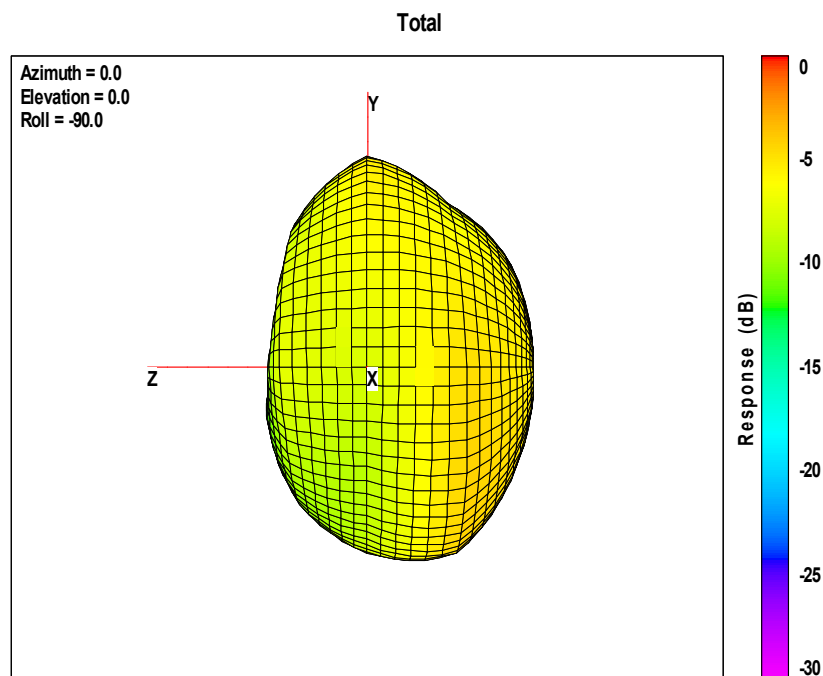


CWS Antenna Return loss



Antenna Radiation Pattern

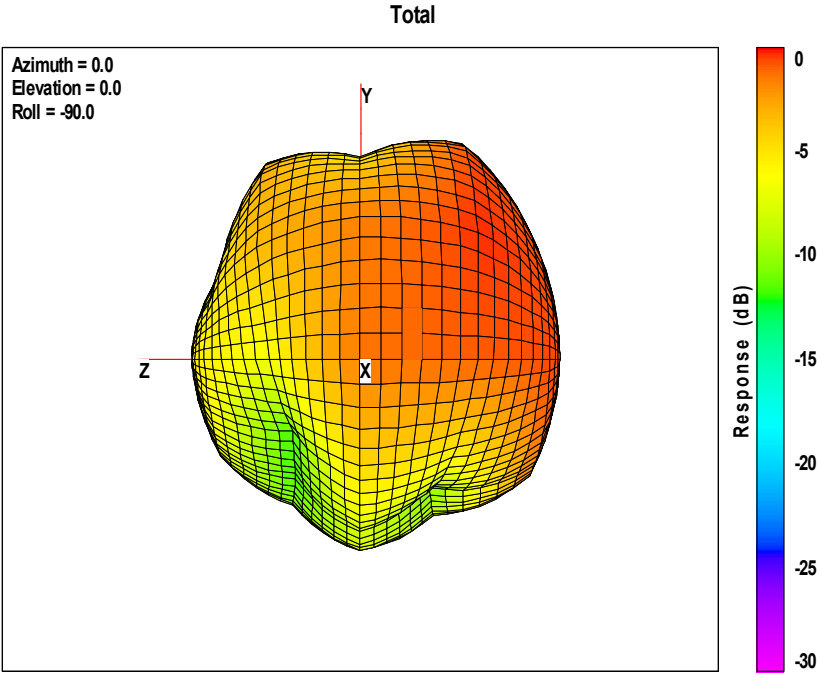
Band 5



Detailed data

B5									
Total	Frequency (MHz)	824	834	844	854	864	874	884	894
	Point Values								
	Ant. Port Input Pwr. (dBm)	0	0	0	0	0	0	0	0
	Tot. Rad. Pwr. (dBm)	-7.94566	-7.57399	-7.17217	-6.96583	-6.98216	-7.24201	-7.66679	-8.20345
	Peak EIRP (dBm)	-4.23868	-4.55861	-4.19153	-4.02425	-4.07225	-4.32441	-4.73585	-5.04504
	Directivity (dBi)	3.70697	3.01538	2.98065	2.94158	2.90991	2.9176	2.93094	3.15841
	Efficiency (dB)	-7.94566	-7.57399	-7.17217	-6.96583	-6.98216	-7.24201	-7.66679	-8.20345
	Efficiency (%)	16.0485	17.4824	19.1771	20.1102	20.0347	18.8712	17.1128	15.1236
	Gain (dBi)	-4.23868	-4.55861	-4.19153	-4.02425	-4.07225	-4.32441	-4.73585	-5.04504

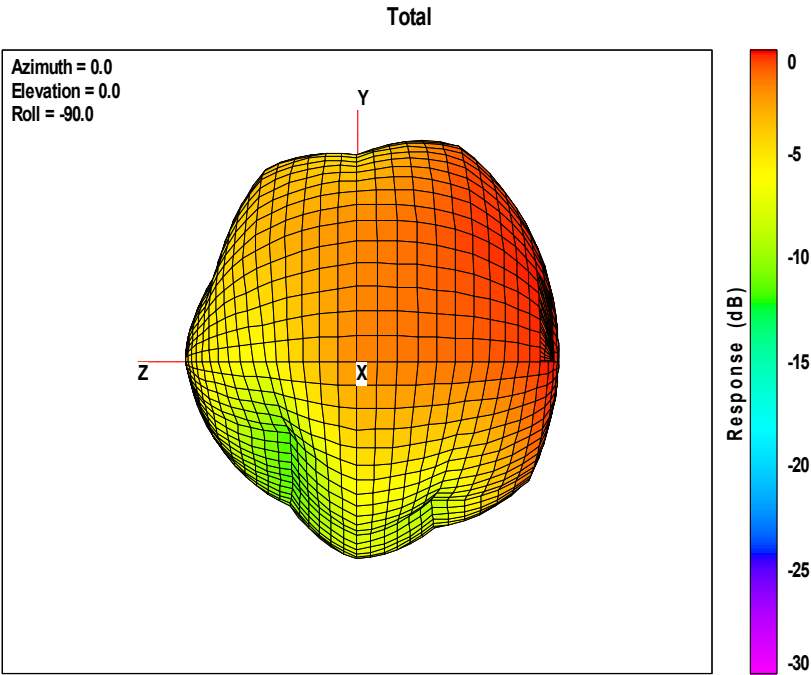
Band 2



Detailed data

B2																
Total	Frequency (MHz)	1850	1860	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970	1980	1990
	Point Values															
	Ant. Port Input Pwr. (dBm)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Tot. Rad. Pwr. (dBm)	-3.73348	-3.64844	-3.60567	-3.60987	-3.5952	-3.57967	-3.53851	-3.50829	-3.4206	-3.42144	-3.34765	-3.23672	-3.1881	-3.23138	-3.31202
	Peak EIRP (dBm)	-0.56169	-0.36371	-0.21813	-0.12529	-0.00115	0.067969	0.144952	0.192754	0.269401	0.214327	0.464643	0.778126	0.9707	1.05468	1.17235
	Directivity (dBi)	3.17179	3.28473	3.38754	3.48458	3.59404	3.64764	3.68346	3.70105	3.69	3.63577	3.81229	4.01485	4.1588	4.28607	4.48437
	Efficiency (dB)	-3.73348	-3.64844	-3.60567	-3.60987	-3.5952	-3.57967	-3.53851	-3.50829	-3.4206	-3.42144	-3.34765	-3.23672	-3.1881	-3.23138	-3.31202
	Efficiency (%)	42.3304	43.1674	43.5947	43.5525	43.6999	43.8564	44.2741	44.5831	45.4925	45.4837	46.2632	47.46	47.9943	47.5184	46.6442
	Gain (dBi)	-0.56169	-0.36371	-0.21813	-0.12529	-0.00115	0.067969	0.144952	0.192754	0.269401	0.214327	0.464643	0.778126	0.9707	1.05468	1.17235

Band 4



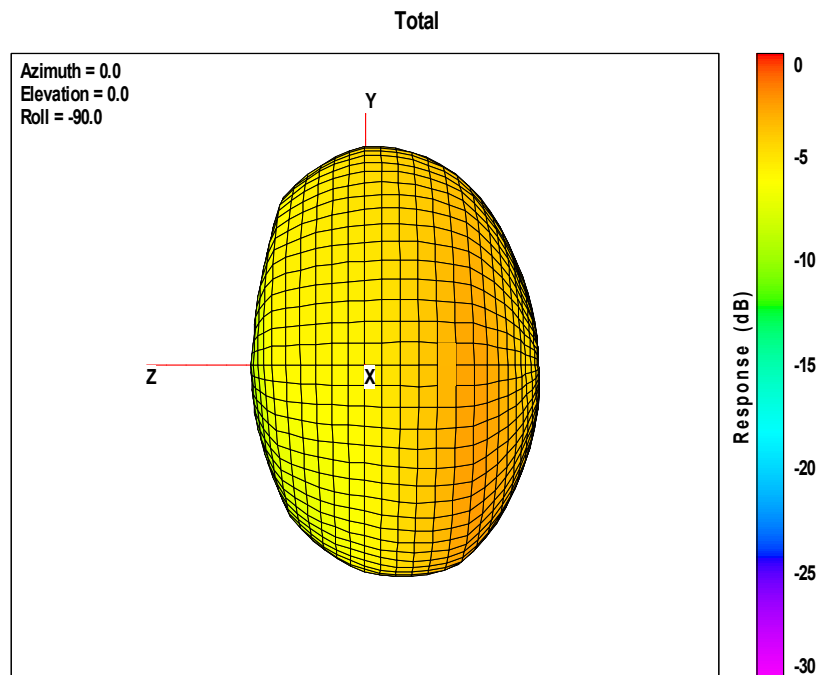
Detailed data

B4																		
Total	Frequency (MHz)	1710	1720	1730	1740	1750	1760	1770	1780	1790	1800	1810	1820	1830	1840	1850	1860	
	Point Values																	
	Ant. Port Input Pwr. (dBm)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Tot. Rad. Pwr. (dBm)	-3.28869	-3.20769	-3.55473	-3.48661	-3.57415	-3.75475	-3.78635	-3.74803	-3.64108	-3.59415	-3.58447	-3.58741	-3.61872	-3.65197	-3.70504	-3.62346	
	Peak EIRP (dBm)	0.724532	0.478222	0.209074	0.276207	0.12076	-0.1392	-0.25706	-0.27952	-0.22574	-0.29123	-0.4536	-0.68681	-0.69664	-0.60374	-0.55893	-0.37404	
	Directivity (dBi)	4.01322	3.68592	3.76381	3.76282	3.69491	3.61555	3.52929	3.46851	3.41534	3.30292	3.13087	2.9006	2.92208	3.04822	3.14611	3.24942	
	Efficiency (dB)	-3.28869	-3.20769	-3.55473	-3.48661	-3.57415	-3.75475	-3.78635	-3.74803	-3.64108	-3.59415	-3.58447	-3.58741	-3.61872	-3.65197	-3.70504	-3.62346	
	Efficiency (%)	46.8955	47.7783	44.1089	44.8063	43.9122	42.1236	41.8181	42.1888	43.2406	43.7104	43.8079	43.7783	43.4638	43.1324	42.6085	43.4164	
	Gain (dBi)	0.724532	0.478222	0.209074	0.276207	0.12076	-0.1392	-0.25706	-0.27952	-0.22574	-0.29123	-0.4536	-0.68681	-0.69664	-0.60374	-0.55893	-0.37404	

	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970	1980	1990	2000	2010	2020	2030	2040	2050	2060
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	-3.5798	-3.59048	-3.57409	-3.56075	-3.51902	-3.49298	-3.40799	-3.41027	-3.34617	-3.23249	-3.18962	-3.23922	-3.31513	-3.35076	-3.34532	-3.39289	-3.45359	-3.417	-3.39888	-3.45262
	-0.20352	-0.11817	-0.01428	0.056156	0.127126	0.178061	0.256316	0.195358	0.487369	0.793425	0.952763	1.05341	1.17216	1.34388	1.53178	1.62677	1.71609	1.86965	1.96472	1.94523
	3.37628	3.47231	3.5598	3.6169	3.64614	3.67104	3.66431	3.60563	3.83354	4.02591	4.14238	4.29263	4.4873	4.69464	4.8771	5.01966	5.16968	5.28665	5.3636	5.39785
	-3.5798	-3.59048	-3.57409	-3.56075	-3.51902	-3.49298	-3.40799	-3.41027	-3.34617	-3.23249	-3.18962	-3.23922	-3.31513	-3.35076	-3.34532	-3.39289	-3.45359	-3.417	-3.39888	-3.45262
	43.8551	43.7474	43.9128	44.0479	44.4732	44.7407	45.6248	45.6009	46.2789	47.5063	47.9776	47.4327	46.6108	46.23	46.2879	45.7837	45.1483	45.5303	45.7206	45.1583
	-0.20352	-0.11817	-0.01428	0.056156	0.127126	0.178061	0.256316	0.195358	0.487369	0.793425	0.952763	1.05341	1.17216	1.34388	1.53178	1.62677	1.71609	1.86965	1.96472	1.94523

	2070	2080	2090	2100	2110	2120	2130	2140	2150	2155
	0	0	0	0	0	0	0	0	0	0
	-3.62142	-3.69628	-3.81059	-3.8984	-3.94191	-3.99197	-4.01029	-4.17144	-4.33384	-4.39389
	1.75261	1.66217	1.54746	1.4195	1.35576	1.21593	1.0739	0.747273	0.366518	0.219929
	5.37403	5.35845	5.35806	5.3179	5.29767	5.20791	5.08419	4.91871	4.70036	4.61382
	-3.62142	-3.69628	-3.81059	-3.8984	-3.94191	-3.99197	-4.01029	-4.17144	-4.33384	-4.39389
	43.4368	42.6945	41.5854	40.753	40.3468	39.8844	39.7165	38.2698	36.8651	36.3589
	1.75261	1.66217	1.54746	1.4195	1.35576	1.21593	1.0739	0.747273	0.366518	0.219929

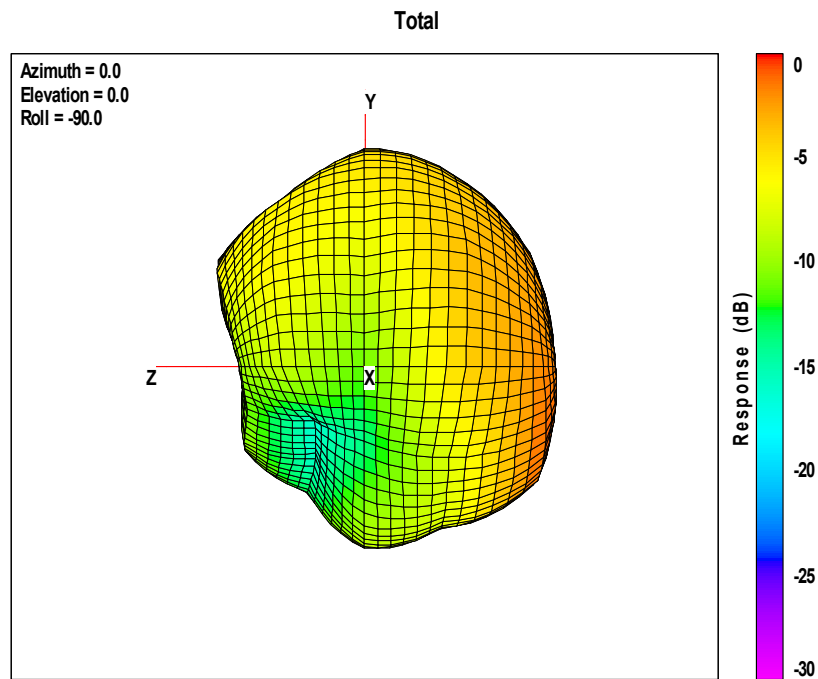
Band 14



Detailed data

B14							
Total	Frequency (MHz)	750	760	770	780	790	800
	Point Values						
	Ant. Port Input Pwr. (dBm)	0	0	0	0	0	0
	Tot. Rad. Pwr. (dBm)	-4.89983	-4.83556	-5.11587	-5.54479	-5.98349	-6.57877
	Peak EIRP (dBm)	-2.10016	-1.88465	-2.07106	-2.47294	-2.94329	-3.55363
	Directivity (dBi)	2.79967	2.95091	3.0448	3.07185	3.0402	3.02513
	Efficiency (dB)	-4.89983	-4.83556	-5.11587	-5.54479	-5.98349	-6.57877
	Efficiency (%)	32.3607	32.8431	30.7902	27.8946	25.2145	21.9848
	Gain (dBi)	-2.10016	-1.88465	-2.07106	-2.47294	-2.94329	-3.55363

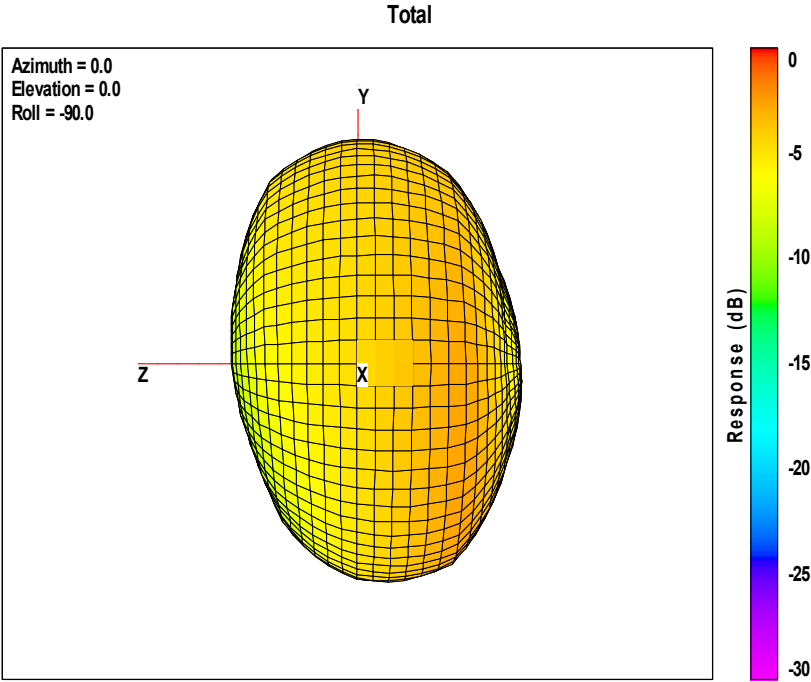
Band 30



Detailed data

B30								
Total	Frequency (MHz)	2300	2310	2320	2330	2340	2350	2360
	Point Values							
	Ant. Port Input Pwr. (dBm)	0	0	0	0	0	0	0
	Tot. Rad. Pwr. (dBm)	-4.85391	-5.04363	-5.32571	-5.71815	-6.13692	-6.65145	-7.15501
	Peak EIRP (dBm)	-0.509	-0.51532	-0.51481	-0.67879	-0.89801	-1.3958	-1.92533
	Directivity (dBi)	4.34491	4.52831	4.81091	5.03936	5.23891	5.25566	5.22967
	Efficiency (dB)	-4.85391	-5.04363	-5.32571	-5.71815	-6.13692	-6.65145	-7.15501
	Efficiency (%)	32.7046	31.3067	29.3379	26.8031	24.3393	21.62	19.253
	Gain (dBi)	-0.509	-0.51532	-0.51481	-0.67879	-0.89801	-1.3958	-1.92533

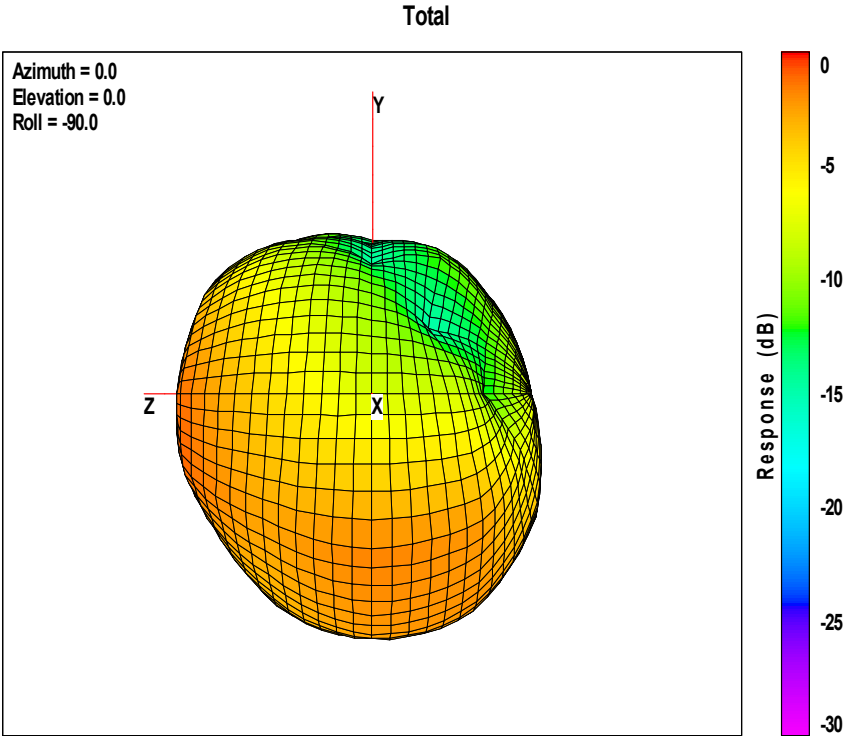
Band 12



Detailed data

B12							
Total	Frequency (MHz)	700	710	720	730	740	750
	Point Values						
	Ant. Port Input Pwr. (dBm)	0	0	0	0	0	0
	Tot. Rad. Pwr. (dBm)	-5.86724	-5.406	-5.05073	-4.95067	-5.43064	-6.08397
	Peak EIRP (dBm)	-2.74044	-2.51981	-2.2744	-2.18335	-2.63037	-3.16094
	Directivity (dBi)	3.1268	2.88619	2.77633	2.76732	2.80027	2.92304
	Efficiency (dB)	-5.86724	-5.406	-5.05073	-4.95067	-5.43064	-6.08397
	Efficiency (%)	25.8986	28.8005	31.2556	31.984	28.6376	24.6379
	Gain (dBi)	-2.74044	-2.51981	-2.2744	-2.18335	-2.63037	-3.16094

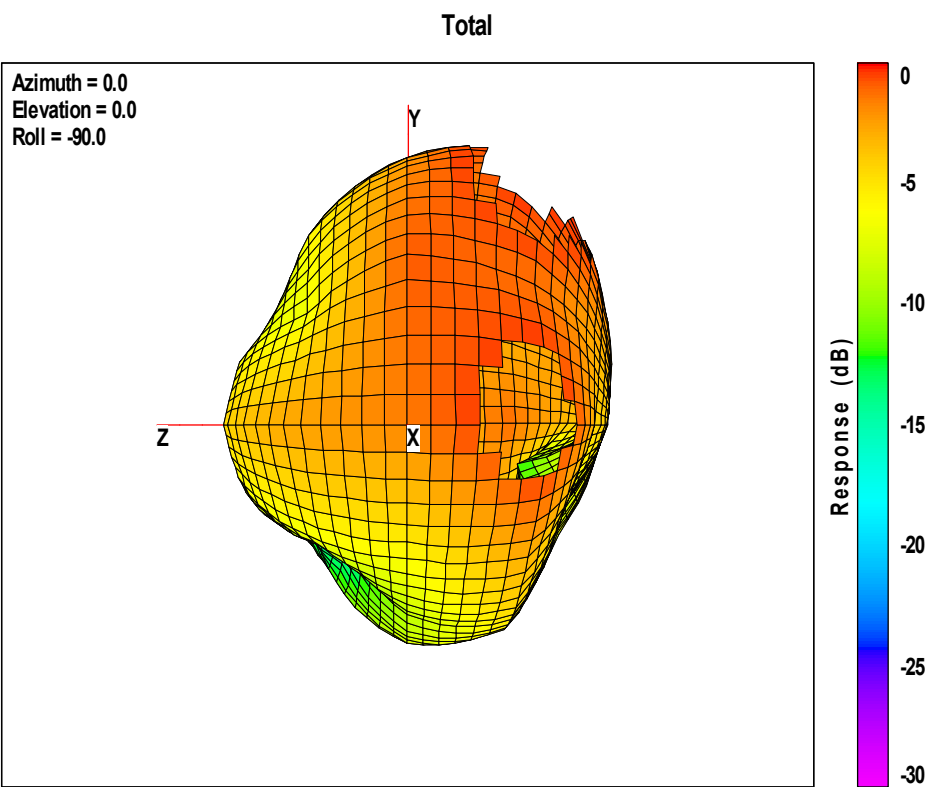
WIFI2.4G/BT



Detailed data

WiFi_2.4GHz												
Total	Frequency (MHz)	2400	2410	2420	2430	2440	2450	2460	2470	2480	2490	2500
Point Values												
	Ant. Port Input Pwr. (dBm)	0	0	0	0	0	0	0	0	0	0	0
	Tot. Rad. Pwr. (dBm)	-6.36691	-5.94389	-5.5501	-5.22317	-4.94212	-4.83204	-4.78974	-4.9005	-5.09496	-5.24444	-5.50826
	Peak EIRP (dBm)	-1.88517	-1.54089	-1.26829	-1.10467	-0.93158	-0.87928	-0.84558	-0.8339	-0.91741	-0.93224	-1.13827
	Directivity (dBi)	4.48174	4.403	4.28182	4.1185	4.01054	3.95276	3.94416	4.0666	4.17756	4.3122	4.36999
	Efficiency (dB)	-6.36691	-5.94389	-5.5501	-5.22317	-4.94212	-4.83204	-4.78974	-4.9005	-5.09496	-5.24444	-5.50826
	Efficiency (%)	23.0839	25.4455	27.8605	30.0389	32.047	32.8697	33.1915	32.3556	30.9388	29.8921	28.1303
	Gain (dBi)	-1.88517	-1.54089	-1.26829	-1.10467	-0.93158	-0.87928	-0.84558	-0.8339	-0.91741	-0.93224	-1.13827

WIFI 5G



Detailed data

WiFi 5 GHz															
Total	Frequency (MHz)	5150	5160	5170	5180	5190	5200	5210	5220	5230	5240	5250	5260	5270	5280
	Point Values														
	Ant. Port Input Pwr. (dBm)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Tot. Rad. Pwr. (dBm)	-2.93672	-2.85515	-2.8628	-2.78158	-2.60478	-2.52698	-2.46625	-2.42004	-2.48972	-2.35092	-2.45256	-2.64649	-2.8572	-3.05655
	Peak EIRP (dBm)	2.09687	2.16571	2.17856	2.19618	2.39953	2.22848	2.05712	1.96104	2.12648	2.59811	2.76301	2.98242	2.91559	2.78724
	Directivity (dBi)	5.03359	5.02086	5.04136	4.97776	5.0043	4.75547	4.52337	4.38108	4.61619	4.94903	5.21556	5.6289	5.77279	5.84379
	Efficiency (dB)	-2.93672	-2.85515	-2.8628	-2.78158	-2.60478	-2.52698	-2.46625	-2.42004	-2.48972	-2.35092	-2.45256	-2.64649	-2.8572	-3.05655
	Efficiency (%)	50.8543	51.8185	51.7273	52.7038	54.8937	55.8858	56.6728	57.2791	56.3674	58.198	56.8518	54.369	51.7941	49.4703
	Gain (dBi)	2.09687	2.16571	2.17856	2.19618	2.39953	2.22848	2.05712	1.96104	2.12648	2.59811	2.76301	2.98242	2.91559	2.78724

5290	5300	5310	5320	5330	5340	5350	5360	5370	5380	5390	5400	5410	5420	5430	5440	5450	5460
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-3.27195	-3.46573	-3.82654	-3.81038	-3.80262	-3.75128	-3.70114	-3.70625	-3.67416	-3.67792	-3.84519	-3.9792	-4.0261	-3.93765	-3.87763	-3.91424	-3.85041	-3.8532
2.54597	2.03625	1.67346	1.43185	1.20387	1.25389	1.33117	1.6688	1.94608	2.18022	2.25938	2.37857	2.55847	2.72282	2.86256	2.64569	2.48708	2.24788
5.81792	5.50198	5.50001	5.24224	5.00649	5.00517	5.03232	5.37505	5.62024	5.85814	6.10457	6.35777	6.58456	6.66047	6.74019	6.55993	6.33749	6.10107
-3.27195	-3.46573	-3.82654	-3.81038	-3.80262	-3.75128	-3.70114	-3.70625	-3.67416	-3.67792	-3.84519	-3.9792	-4.0261	-3.93765	-3.87763	-3.91424	-3.85041	-3.8532
47.0766	45.0222	41.433	41.5874	41.6618	42.1572	42.6467	42.5966	42.9125	42.8754	41.2554	40.0018	39.5722	40.3864	40.9484	40.6047	41.2059	41.1794
2.54597	2.03625	1.67346	1.43185	1.20387	1.25389	1.33117	1.6688	1.94608	2.18022	2.25938	2.37857	2.55847	2.72282	2.86256	2.64569	2.48708	2.24788

5470	5480	5490	5500	5510	5520	5530	5540	5550	5560	5570	5580	5590	5600	5610	5620	5630	5640	5650
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-3.93943	-4.01074	-4.11537	-4.03981	-3.86539	-3.88298	-4.00339	-4.13387	-4.08925	-4.17422	-4.15762	-4.0944	-3.90812	-3.69879	-3.59488	-3.65368	-3.65237	-3.63781	-3.7907
1.89758	1.90636	1.98979	2.07242	2.29821	2.24876	1.9775	1.92567	2.15624	2.13925	2.19802	2.10591	2.13769	2.22755	2.58556	2.674	2.75911	2.81371	2.55598
5.837	5.91709	6.10516	6.11223	6.1636	6.13174	5.98089	6.05954	6.24548	6.31347	6.35564	6.20032	6.04582	5.92634	6.18044	6.32767	6.41148	6.45153	6.34668
-3.93943	-4.01074	-4.11537	-4.03981	-3.86539	-3.88298	-4.00339	-4.13387	-4.08925	-4.17422	-4.15762	-4.0944	-3.90812	-3.69879	-3.59488	-3.65368	-3.65237	-3.63781	-3.7907
40.3699	39.7124	38.7671	39.4475	41.064	40.898	39.7796	38.6023	39.001	38.2453	38.3917	38.9547	40.6619	42.6699	43.7031	43.1154	43.1283	43.2732	41.7763
1.89758	1.90636	1.98979	2.07242	2.29821	2.24876	1.9775	1.92567	2.15624	2.13925	2.19802	2.10591	2.13769	2.22755	2.58556	2.674	2.75911	2.81371	2.55598

5660	5670	5680	5690	5700	5710	5720	5730	5740	5750	5760	5770	5780	5790	5800	5810	5820	5830	5840	5850
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-4.04999	-4.19478	-4.22713	-4.15905	-4.07895	-3.93308	-3.84368	-3.83727	-3.86977	-4.05975	-4.21618	-4.28042	-4.33589	-4.38395	-4.37709	-4.54736	-4.79393	-4.96837	-5.11019	-5.41581
2.20217	1.88487	1.61078	1.47268	1.6916	1.99806	1.99944	1.95917	1.64933	1.58197	1.69064	1.6412	1.80925	1.79695	1.75217	1.50779	0.825104	0.406689	0.485283	
6.25216	6.07965	5.83792	5.63173	5.77055	5.93114	5.84311	5.79644	5.5191	5.64172	5.90682	5.92162	6.14514	6.1809	6.12926	6.05515	5.61903	5.37506	5.59548	5.41569
-4.04999	-4.19478	-4.22713	-4.15905	-4.07895	-3.93308	-3.84368	-3.83727	-3.86977	-4.05975	-4.21618	-4.28042	-4.33589	-4.38395	-4.37709	-4.54736	-4.79393	-4.96837	-5.11019	-5.41581
39.3551	38.0647	37.7822	38.3791	39.0936	40.4289	41.2698	41.3307	41.0226	39.2667	37.8776	37.3214	36.8477	36.4423	36.4999	35.0965	33.1594	31.8539	30.8305	28.7355
2.20217	1.88487	1.61078	1.47268	1.6916	1.99806	1.99944	1.95917	1.64933	1.58197	1.69064	1.6412	1.80925	1.79695	1.75217	1.50779	0.825104	0.406689	0.485283	-0.00011

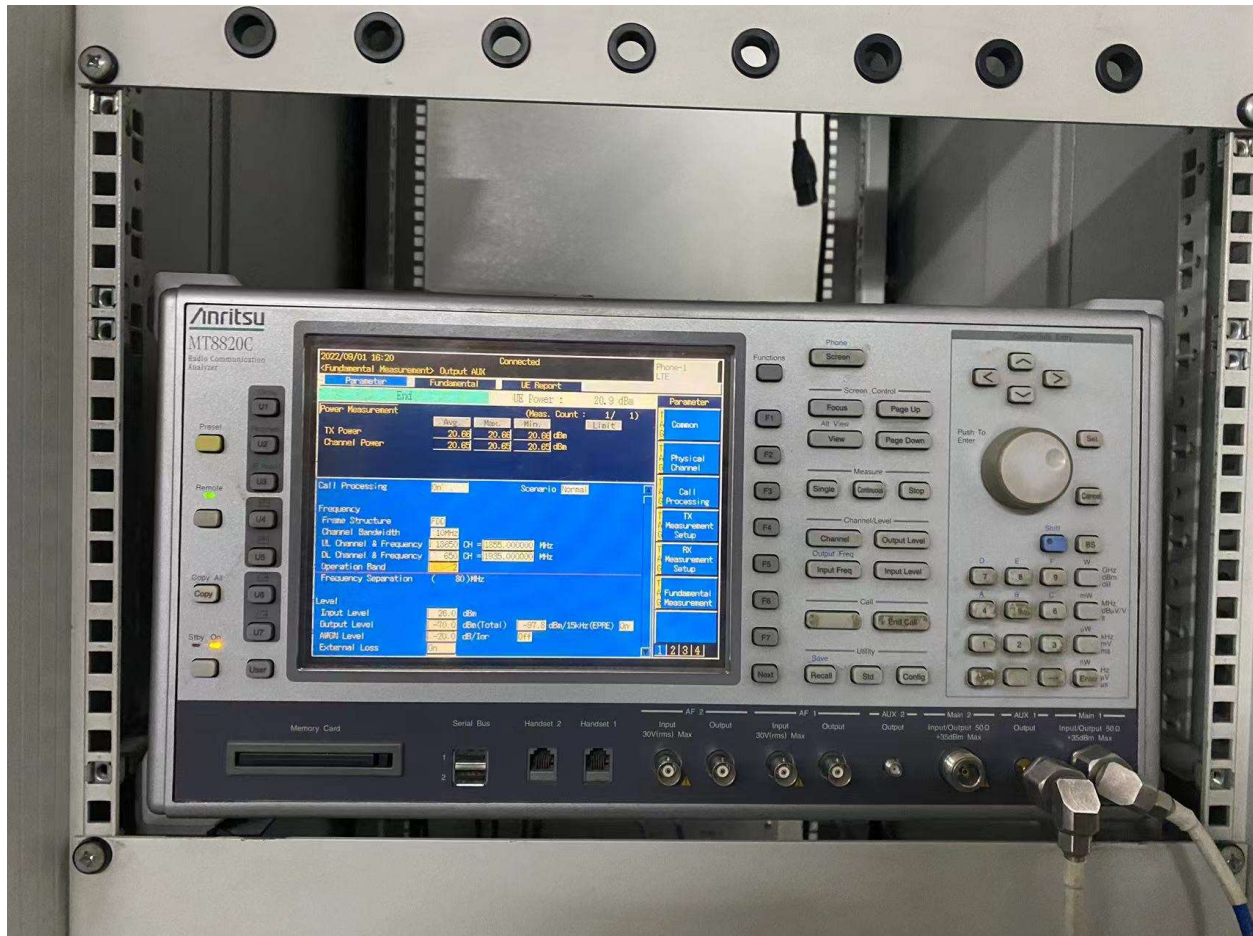
Test equipment:

Equipment:

Supplier: Anritsu

Model number: MT8820C

Software version: 23.03



Test setup:

Satimo chamber: chamber information/equipment information/LTE
band5TRP&TIS test setup

For example: LTE Band 5 TRP/TIS

OTA chamber

Supplier : Satimo

model: SG24

SW version: Wave Studio 1.8

Equipment :

Supplier: Anritsu

Model number: MT8820C

SW version: 23.03

Test setup 1:

Standard: LTE

Type: TRP

Duplex mode: FDD

Band 5

Bandwidth: 10MHz

UL Channel: 20450/20525/20600

UL RB number: 12RB

UL RB start: 0/19/38 RB

DL RB number: 50 RB

DL RB start: 0 RB

TPC: max

Max power: 33dbm

Theta step: 30°

Phi step: 30°

Test setup 2:

Standard: LTE

Type: TIS

Methodology: Based on RSSI

Duplex mode: FDD

Band 5

Bandwidth: 10MHz

DL Channel: 2600

UL RB number: 25RB

UL RB start: 25RB

DL RB number: 50RB

DL RB start: 0RB

TPC: Max

Max power: 33dbm

Theta step: 30°

Phi step: 30°

OTA chamber

Supplier: ETS

Model number: AMS8500

SW version: EMQUEST 1.12

Equipment:

Supplier: Key sight

Module number: E5071C

SW version: A.11.23

Measurement procedure:

When the test software and equipment ready, put the proto on the test position (FS, BH, BHH), run the test software, normally TRP need around 10-15 minutes, and one channel TIS also need around 15 minutes, after that, we can see the detailed number for TRP and TIS.

Antenna engineer: Zou Saisai, Jim Li

Sep. 8. 2022